

*With the Author's kind regards.*  
Modern Surgery as a Science and an Art

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THE ORATION

DELIVERED BEFORE THE

Medical Society of London

ON

THE NINETY-NINTH ANNIVERSARY

MAY 6th, 1872

BY

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CRIMEA AND SCUTARI.


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IN publishing this Oration, at the request of the Medical Society of London, the Author trusts that the expression of approbation which prompted that request, will cover the omissions which are unavoidable within the narrow limits of an Address, on a subject so comprehensive.



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# ORATION.

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MR. PRESIDENT AND FELLOWS :—

The time-honoured custom of this Society of annually delivering an Oration or Address, has this year, by the election of the council, devolved upon me. While, under any circumstances, I should duly appreciate the honour thus conferred, I do so the more deeply from having also held—and only last year—the position of your Lettsomian Professor. When, however, I accepted the responsibility of the further trust reposed in me, by the official capacity in which I now appear before you, I was much impressed with the difficulty of the duty I had undertaken, lest I should fall short of the already achieved results of many a distinguished predecessor. It was, indeed, this embarrassment which first suggested to me the choice of a subject or theme wherewith I might engage your attention. On looking over the Orations which had previously been delivered, I perceived that the history and proceedings of this Society had been narrated so admirably, and with almost exhaustive completeness—in fact, last year, with regard to medicine, by Dr. Cholmeley—that to indulge the hope of offering some attraction, I must roam in search of “fresh fields and pastures new.” Accordingly, I resolved on asking you to accompany me while I endeavoured to point out the landmarks and leading features of a scene, which, although not confined to the associations of this Society, is yet fruitfully illustrated by the produce of its labourers;—I allude to the Aspects of Modern Surgery, as a Science and an Art. And it seemed to me an appropriate and profitable opportunity thus to review the past, on the occasion of our approaching centenary, for it has been during the modern period of the last hundred years, that Surgery has gradually assumed the dignity

of the twofold position here accorded to it. Nor should those whose pathway lies more in the direction of Medicine imagine, for a moment, that I would presume to draw any sharp line of demarcation in favour of the progress of Surgery. Neither my own taste, nor truth would sanction any such narrow restriction. The illustrations which I shall bring before you may be more purely Surgical; but the great fundamental truths which have grown up during the last century, belong to a common Pathology, and to an indivisible Physiology and Anatomy, of man.

But we must move to yet higher ground than this in our contemplation of modern Surgery, as a Science. Animated, or rather inspired, by a far more comprehensive spirit of inquiry, than that which relates to the human species alone, John Hunter commenced his labours. His view of Pathology was an extension of a colossal Physiology, and a corresponding Anatomy, embracing the whole living creation. It was from this vast range of Biological Science that Hunter sought to interpret the structural conditions and the phenomena of life, in any one species; and thus, for example, to enlighten our otherwise isolated knowledge of *human* anatomy, physiology, and pathology,—of man, structurally and functionally, in the states of health and disease. From this elevated point of view we must look, to justly appreciate the Hunterian conception, and its influence on the British School of Surgery. Subsequently, it became apparent how largely and intimately the Sciences of Physics and Chemistry enter into this system of Biology; and thence we might trace the grand contributions of the Continental Schools, more especially, and particularly in Germany and France. Here then we discern the three primary elements of modern Scientific Medicine.

But there is another and more immediate sense in which Modern Surgery claims the rank of a Science; namely, by virtue of the progress of Pathology; of that Science which teaches the nature of all the abnormal or diseased changes which the living organism is liable to undergo; the causes of such conditions; their vital course, terminations, and consequences. In this country, the section of Pathology which relates to Surgery, has assumed a representative position,

mainly by the labours of Sir James Paget, as recorded in his renowned "Lectures," and "The Pathological Catalogue of the Museum of the Royal College of Surgeons"; while, in Germany particularly, Surgical Pathology has been developed by the genius of Virchow and Billroth. As the immediate source of enlightenment in Surgery, it has been the object I have ever had in view, thus to cultivate Pathology.

In relation to Anatomy and Physiology, the truth has become fully recognised that disease is not an independent entity in the body,—as if foreign to the healthy organism; but that Pathology represents only *modes* of living and modes of dying; thus supplementing and completing the other sciences of life, as one indivisible Biology. The line of transition from healthy to diseased states, in regard to structure and function, is indefinite; and variable in the history of every individual existence. For the investigation of Pathology, it is, however, absolutely necessary to be impressed with another truth,—of modern recognition; that the nature of diseased states can only be discovered by separate observation—in the twofold way of clinical, and post-mortem examination, and that in this sense—but in this sense only—Pathology is a science independent of, and apart from, Physiology. The credit of having disestablished the error which formerly prevailed—is it still altogether eradicated?—belongs to Dr. Walshe. In an admirably lucid lecture on "The Logical Applications of Physiology to Pathology," delivered at University College, October 1st, 1849—he fully enunciated and established this important position. Physiology does, indeed, form the standard of comparison whereby to determine, if possible, the transition to pathological conditions; and the knowledge of healthy states may interpret those of disease; and, moreover, suggest new directions for such inquiry; but physiological knowledge, however profound, can never *foretell* the nature of pathological conditions. In relation to pathology, the province of physiology is threefold,—to compare, to explain, to suggest; never to predicate. As one Science of Life, pathology is a continuation of physiology; but its facts and laws can be discovered only by separate and independent observation. Prior to the recognition of this truth, pathologists groped in the



dark, guided only by the reflected light of a physiological pathology, and seeming to discover diseases which had no existence. Thus, the synocha or pure idiopathic inflammatory fever of Cullen, was a quasi-disease, which that nosologist acknowledged he had never met with in all his clinical observation; neither had Dr. James Gregory, in the course of thirty years' experience; and yet for how long a period did this creation of physiological inference exist in the schools, and in systematic works, as an observed and observable reality!

Taking our stand at the bedside, true pathology opens before us a vast field for culture. Functional disturbances have to be connected, if possible, with alterations of structure, with perhaps changes of physical character and of chemical composition, in the organs, textures, or fluids of the body. Diseases thus constituted, have to be traced back to their causes, either to other diseases, local or constitutional, within the body, or to external circumstances; while the operation of the disease itself as a cause of other morbid conditions must also be investigated; and lastly, the vital history of the whole has to be watched, and anticipated, in regard to its course, terminations, and consequences. Accordingly, clinical observation embraces the threefold division, familiarly known as Diagnosis, Etiology, and Prognosis; and it is in the development of these subdivisions of clinical inquiry,—guided by the progress of Pathology, instead of the mere suggestions of empirical experience, that we may discover the more immediate aspects of Modern Surgery as a Science.

First and foremost in virtue of *Diagnosis*. The leading character of modern Diagnosis seems to be, the earlier and more exact detection and discrimination of diseases. And, perhaps, the most remarkable consequence of this advance has been, the far greater analytical power of Diagnosis. Morbid conditions which were formerly regarded as simple, have thus been discovered to be compound—to consist of several diseases, which may, or may not, be associated; each of which presents its own individual pathological history, and has its own peculiar treatment. One of the most striking illustrations of this diagnostic analysis is afforded by our



present differentiation of joint diseases. The term,—“white-swelling,” which was formerly in vogue, is now known to have included at least three diseases of dissimilar character;—scrofulous caries, synovitis, and primary ulceration of the articular cartilages, this analysis having been clearly established by the diagnostic investigations of Sir B. Brodie. Under the old term Amaurosis, several distinct diseases of the retina have been discerned. Again, in the province of medicine; Continued Fever, by the clinical observations of Sir William Jenner, has been resolved into Typhus and Typhoid, exanthematous diseases as distinct as smallpox and measles. More recently also, the term phthisis pulmonalis, which in the time of Louis signified exclusively tubercular disease of the lungs, is now being resolved into other diseases, by the penetrating analysis of modern diagnosis, and notably by the clinical acumen of the late President of this Society, Dr. Andrew Clark; quite recently also by Dr. Sausom. It is needless to point out how much all this advancement of Diagnosis has metamorphosed, and is still changing, the old nomenclature of diseases and the old Nosologies. But, in the history of modern Diagnosis, the analytical process of investigation has borne even richer fruit than by the resolution of compound diseases. The very constituent elements of Diagnosis itself have been distinguished,—as the physical, the structural, and the chemical signs of disease, thence giving rise to the three known *methods* of Diagnosis. It is important to notice that these methods represent the application of Pathological Anatomy, during life,—Clinical Pathological Anatomy as I have named it when thus applied, to the detection and discrimination of diseases. The language whereby this Science reveals the various kinds of disease is spoken, as it were, in these three dialects. Functional disturbances represent the older and less certain method of Symptomatic Diagnosis,—the offspring of pure Pathology, unsupported by Pathological Anatomy. Look, for a few moments, and gather some of the produce of the methods of *modern* Diagnosis.

*Physical* diagnosis has been pursued with increasing exactitude of observation, and delicacy of appliances, in all the departments of modern surgery, scarcely less than in medicine,

which, with regard to diseases of the thoracic organs more particularly, has almost revolutionized our clinical knowledge. The eye, the hand, the ear, have been alike taught,—to see, to feel, to hear, in the course of bedside examination. Now-a-days we can hardly realize the truthful record left by John Bell, of Surgeons formerly—that, “every day,” says he, “we see the surgeon mistaking blood for matter, flesh for bone, and tumours, malignant in their nature, for indolent and harmless swellings.” Where marks of modern progress abound on all sides, it is almost difficult and unnecessary to select particular instances. But I might still point to diseases of the joints, for example; the physical signs in respect to the shape, size, and consistency of the swelling, being characteristically different in each inflammatory affection of a joint. The globular swelling of articular cavities contrasts with the enlargement from distension of the capsule in synovitis; and both differ notably from the slight, marginal puffy swelling, corresponding to the outline of the cartilages, in primary ulceration of the articular surfaces.

Passing on to the method of Diagnosis by *Structural* characters, we are led to examine all those changes of texture which are announced by *débris*, or by morbid products and secretions, discharged from the natural passages,—as the mouth, œsophagus, stomach, and intestines; the lungs, urinary bladder, kidneys, uterus and vagina; those also which are yielded externally, by or through the skin, or procured by puncture, as from tumours. This turning out of the interior of the body, or gathering from its surface, supplies the materials for all that minute inspection which is associated with the achievements of microscopic examination. Among tumours or morbid growths, for instance, the diagnostic value of structural characters, and as compared with physical diagnosis, is forcibly illustrated by the differentiation of the recurring varieties of non-malignant tumours, from the typical forms of such tumours. Thus, the fibro-nucleated tumour—a recurring growth, and the ordinary fibrous tumour, possess the same physical characters,—those of a hard, elastic, lobulated tumour; but the recurring form represents only a rudimentary condition of fibrous tissue,—consisting of fine filaments infiltrated with an abundance of well-defined oval nuclei; whereas, the fibrous tumour consists

simply of developed fibrous tissue. These two structural conditions can be readily distinguished under the microscope, and by merely puncturing the tumour with a grooved needle, this method of Diagnosis is made available in clinical examination. Its critical value lies in the fact, that tumours which otherwise present the physical characters of identity,—and would thus be mistaken, have yet a widely different vital history and therapeutic importance. An ordinary fibrous tumour, never recurring, admits of removal by the knife as a certain cure; but, a fibro-nucleated tumour recurring, is so far allied to a cancerous growth, and when removed, springs up again and again, so that in spite of surgical interference, it not unfrequently runs its course to a fatal termination. The same diagnostic superiority of structural characters, might be further exemplified by the recurring fibroid, as compared with the fibrous tumour, in relation to their vital history and treatment; while, if time permitted, something might be said to reclaim the value of the structural method of Diagnosis with regard to cancer-growths. The whole of this inquiry is enlarged in my “Principles of Surgery.”

But, if the microscopic examination of organized products has yielded important diagnostic results in relation to Surgery, how fruitful has been this method of diagnosis in its extension to crystalline forms. No one will dispute the value of the knowledge thus acquired respecting Urinary Deposits. Overlooking the varieties observed in the crystals of each kind of deposit, certain well-defined forms may be regarded as typical, and representing the morbid conditions of urine in which they are found, such crystalline deposits supply conclusive or corroborative evidence of the diseases with which they are more or less constantly and exclusively associated. The rhomboidal prisms of uric acid; the octohedral and dumb-bell crystals of oxalate of lime; and the prismatic, foliaceous, penniform, or stellate crystals of phosphatic deposits; will severally suffice to identify the morbid conditions of urine, which physical characters, and even chemical tests, perhaps, will not so surely determine. Organized forms occurring in the urine, may supply evidence equally trustworthy; casts of the uriniferous tubules, with blood and pus-corpuscles, presenting their characteristic

appearances under the microscope, in connexion with acute desquamative nephritis. Or, the artificial production of certain organized forms in urine, after its emission, may determine diagnosis; as by the yeast-plant in the urine of diabetes mellitus.

*Chemical* diagnosis seems to contend with the structural method, for the value of superiority, in regard to its scientific exactitude. Destined, probably, hereafter to become the most minute method of detecting and discriminating the essential changes which constitute morbid conditions; chemical diagnosis has already thrown a vivid and penetrating light on certain classes of diseases which appertain to Surgery. Urinary Pathology, forming a neutral ground for research, has been cultivated by the labours of Prout, Bence Jones, Golding Bird, Lehmann, Julius Vogel, Neubauer, Owen Rees, Lionel Beale, Thudichum, Parkes, W. Roberts, Hassall, and other physicians; but Urinary Deposits have to be examined also by surgeons, if they would practise their art in the light of modern progress. All the various morbid conditions of the urine are of diagnostic importance in the treatment of surgical diseases, and relative to the favourable circumstances for surgical operations and their after-treatment. This source of guidance is, I am convinced, often the key to the successes and failures of surgical practice in different hands. Albuminuria is specially significant. The escape of albumen in the urine and the retention of urea in the blood,—the daily loss of so much nutriment in one of its highest forms, and the accompanying ureal blood-poisoning, constitute a process so destructive, that, if overlooked, it would undermine any good results in the whole range of operative surgery. Phosphatic urine, in connexion with cystitis, is, I scarcely need say, specially ominous in the treatment of stone in the bladder, as to the relative safety of lithotrity and lithotomy. Now, the chemical tests for these, and all other morbid conditions of the urine, have been reduced to practical forms so simple and conclusive, as to be readily available to every one engaged, and almost under any pressure of time, in Surgical Practice.

I have yet to notice the *Functional* method of Diagnosis. Unlike the *signs* of disease, as declared by physical, structural, and chemical characters, morbid conditions of function are at the best but *symptoms*, or casual coincidences. Functional dis-

turbance does not invariably accompany, and is not at the *earliest* period appreciably associated with injury or local disease; the same disturbance of function is no measure of the structural lesion existing, and it may also accompany the same disease or injury simultaneously in different parts of the body, or may be associated with very different kinds of injury or disease. The clinical history of inflammation—a subject of every-day concern to all practitioners—exhibits very clearly the diagnostic insufficiency of functional symptoms. Take pain, for example. “See,”—says a great master of clinical observation, Dr. Latham—“what a strange, unequal, and uncertain light, pain throws upon diagnosis and treatment. We find it where we do not look for it, and look for it where we do not find it. Its presence is no sure proof, its absence is no sure negation of disease. Of all symptoms,” he continues, “mere pain is the most inconstant and uncertain, whatever be the disease. It is so in pericarditis. It is present in one case, and absent in another, strangely and unaccountably. I have known much pain where the disease has been of little severity, of short duration, and of easy cure; and I have known the severest pericarditis pass through all its stages without pain. All other symptoms have been present to mark its reality and its progress; the murmur, and the precordial dulness, and the fluttering heart, and the respiratory anguish. And sometimes the patient has died, and sometimes he has recovered by a tardy and precarious convalescence. But from first to last, there has absolutely been no pain. Do not be surprised at this. Pleurisy also may exist without pain; even acute, rapid, pus-effusing pleurisy. Peritonitis may exist without pain; even acute, rapid, pus-effusing peritonitis. And so too, if, in pericarditis, there is sometimes no pain, it fortunately happens that there are other signs by which we can fix our diagnosis of the disease equally well without it.” This picture might, I am sure, be reproduced from the clinical history of many other diseases, and with regard to other functional disturbances—their inconstancy in the same disease, their association with very different diseases. The surgeon will be familiar with the same truth, in his diagnosis of fractures, dislocations, and other injuries.



In the department of *Etiology*, modern surgery has gained vast accessions from the progressive development of the laws of Pathology, as to the operation of *internal* causes.

The constitutional origin of local disease, a doctrine first distinctly enunciated and demonstrated by Abernethy, has greatly modified our views of many diseases, and their treatment. Diseases, which were formerly regarded as of local origin, and to be removed by topical applications, have been traced back to their origin in the blood-forming processes; of which such diseases are only manifestations, and are accordingly submitted to constitutional treatment. It has been thus that our knowledge of serofulous affections has been expanded; that many skin-diseases, and ulcerations of mucous membranes, diseases of the eye, the bones and joints, of the testicle, and other parts, have also been referred to constitutional syphilis; while the pathology of gout and rheumatism has been equally fruitful in the interpretation of many otherwise anomalous local affections. Nor has the pathology of the nervous system been unproductive in the same direction; and thus we now recognise hysterical affections of the joints, and other parts of the body, as distinguished from inflammatory disease; a discrimination which has saved many limbs that, doubtless, were formerly sacrificed by an erring surgical interference. On the other hand, the local origin of constitutional disease embraces the causative relations of injury, and local disease, to morbid states of the system. In relation to the nervous system, the vital history of injury comprises the phenomena of shock, collapse, reaction, prostration with excitement or traumatic delirium, and tetanus. The doctrine of constitutional irritation, originally established by Travers, was a fertile source of inquiry for subsequent clinical observers; and only recently, the history of Shock has been further elucidated by the investigations of Furneaux Jordan and Le Gros Clark; while the phenomena of tetanus, by the original researches of Lockhart Clarke, have been connected with certain definite structural changes in the spinal cord,—a hyperæmic state of the blood-vessels with exudation, and disintegrative softening of the gray substance of the cord. The vital history of local disease, in relation to the nervous and vascular systems com-

bined,—another illustration of the pathological law to which I have referred, has equally engaged the attention of clinical observers. Thus, we have come to acquire our present knowledge of the pathology of inflammatory fever, as proceeding from a focus of inflammation in whatever part may be affected ; and the development, subsequently, of hectic fever from prolonged suppuration, and gangrenous typhoid fever from the mortification of the part or local death. All this advancement has been the work of many contributors whose labours cannot be here adverted to.

There is yet another law respecting the operation of internal causes which merits more than a passing notice ; it is the causative relation of local diseases,—that one morbid condition of a part, may give rise to the same, or to another, morbid condition, in another part, continuous, contiguous, or remotely situated in the body. Inflammation exhibits abundant illustrations of these modes of operation as an internal cause. The continuous extension of inflammation is witnessed in its progressive spreading in the skin or mucous membrane, as in erysipelas, and the sore-throat of scarlet-fever. Contiguous extension is illustrated by secondary ulceration of the articular cartilages, consequent on caries of the subjacent bone, or on synovitis. Thus also otitis may proceed from periostitis ; cellulitis from inflammation of the skin ; and conversely. Taking internal organs from the head downwards ; meningitis is succeeded by cerebritis ; scrofulous and purulent ophthalmia, by inflammation of the cornea and deeper textures of the eye ; laryngitis, by œdema glottidis ; gastritis, enteritis, cystitis, and metritis, each probably, by peritonitis. The transference or metastasis of inflammation to a distant part is exemplified by the supervention of orchitis from the sudden suppression of gonorrhœa. Nervous and muscular affections, of a sympathetic kind, might also be referred to, as a large and most interesting class of manifestations, in all organs and regions of the body, more or less remote from their internal causes ; some such affections depending on a cause of irritation in the trunk of the nerve affected, or centrally, in the brain or spinal cord ; or, proceeding from the transference of an impression from one distant nerve to another through the medium of the



central nervous axis—reflected sympathetic affections. Time will not permit me to enter further into this important view of internal causes. Originally, I believe, investigated by Dr. Whytt, the subject was ably elucidated by Sir B. Brodie in his “Local Nervous Affections,”—a work which almost more than any other has influenced the practice of modern Surgery; and recently, yet further light has been thrown thereon, by the researches of Mr. Hilton, in his admirable Lectures on “Pain and Rest.”

It would, I think, prove interesting to complete this general view of diseases in their causative relations to each other, by a summary of what clinical observation has taught respecting the possible association of various diseases—their co-operations and orders of succession in the body. Thus, among blood-diseases; erysipelas,—which occurs not unfrequently in surgical practice—may co-exist with typhus, or with typhoid-fever, with smallpox, or with syphilis—primary or secondary. As illustrating the order of succession most commonly met with; a suppurating wound induces blood-poisoning or pyæmia, and this disease is reflected by the formation of secondary abscesses in various parts of the body. Primary syphilis in its relation to the blood, and thence to secondary syphilitic affections, is another familiar example of the same order of succession. Among diseases of the nervous system, we observe tetanus arising from some local injury, and then reacting upon that part causing it to assume an unhealthy condition. After a strangulated femoral hernia, for which I operated, no bad symptom ensued for a week, then tetanus supervened, and the wound immediately re-opened and became distinctly gangrenous. But I can only just glance at the whole of this inquiry, which I have endeavoured to more fully develop in my “Principles of Surgery.”

*Prognosis* is a department of clinical knowledge, which, compared with modern Diagnosis and Etiology, is far less advanced. To foretell the course and terminations, and the eventual consequences of any given disease or injury, is generally far more difficult than to discover the morbid condition itself, and its causative relations. At the same time, the practical importance of this foreknowledge in relation to

Treatment cannot be doubted,—whether we look to the prevention, or removal, of impending complications, of a fatal issue, or of the consequences which may ensue even in the event of recovery. To this end, the old “prognostics” of symptoms being “good” or “bad,” according to the suggestions of *empirical* experience, affords no better knowledge than can be acquired by observant nurses no less than by practitioners. On the other hand, the intelligible guidance of Pathology has hitherto failed, in most cases, to cast more than a dim and uncertain light on our prognostications. Why is this? There are two unavoidable difficulties to be overcome. The “natural history” of disease has been watched but little, and recorded less; this deficiency in our knowledge being the result of our having to treat disease, as well as to observe its progress; so that its vital history is continually modified by the intervention of our medicinal agents, and operative procedures. Then again, individual peculiarities of constitution, age, sex, social position, and many other circumstances, have to be taken into account, and the influence of which in this or that case, may defy calculation. Certain general principles only seem to be trustworthy:—the persistence of causes in their operation, as the immediate ground of Prognosis; the kind and extent of structural alteration which the organ or part has undergone, and the influence of which is somewhat proportionate to the period during which the disease or injury has continued,—unless, as a chronic lesion to which the system has become habituated. Beyond this source of foreknowledge, the pathology of functional manifestations must determine the probable issue, and its consequences when not a fatal termination.

As we yet linger at the bedside over the living human body, to watch all the wondrous phenomena it presents in its multi-form diseased conditions,—its innumerable modes of living and modes of dying; and, as we have revealed to us also glimpses of that higher life,—the innermost workings of the soul, as a *moral* agent, when almost dissociated from its co-operation with physical forces; do we not, under these privileged circumstances of observation, appreciate the superiority of our *clinical* knowledge of life over that of the pure

anatomist and physiologist in their view of the body only through the course of its development and the evenly balanced condition of health ; and, in our position of final intercourse with nature, are we not favoured with something like an experimental demonstration of that life which is to come, beyond this brief tenure of our earthly existence.

Such, then, are the chief aspects of modern Surgery as a Science. Let us now turn to its practice as an Art. Thus regarded, Surgery, like most other Arts, may be practised in either of two ways—Empirically, by experience alone, or as a Scientific Art, by the guidance of the Science pertaining to it. In its full signification, this Art embraces the scientific, as distinguished from the empirical, practice of diagnosis, etiological investigation, prognosis, and treatment. In its common acceptance, the art of *treatment* is more especially considered ; and from this point of view, the aspects of modern Surgery are singularly interesting.

Pathology has here also done much to place it on a rational basis. Foremost amongst the great truths it has brought to light is—the existence, operation, and resources of a *Restorative* or *Reparative* Power, inborn in the body,—as manifested by the natural course and tendency of diseases or injuries, individually, to or towards recovery. A less definite recognition of this power had prevailed from the time of Hippocrates downwards ; it was the *archæus* of Van Helmont, the *anima* of Ståhl, the *vis medicatrix naturæ* of Cullen ; but the original observations of John Hunter on Reparation, in the Healing of wounds, and after other injuries, first gave a distinctive character to modern Surgical treatment. The great doctrine of adhesion—in its various modifications, has exercised a vast influence over all surgical procedures. The older surgeons, in their treatment of Wounds, never attempted to solicit “union by the first intention,” without any intervening blood or lymph ; nor did they venture to invite union by “adhesive inflammation,” or simply “primary union,” through the medium of plastic lymph, as it is now understood. Believing also,—as John Bell records—that wherever a bone was laid bare, it must exfoliate ; until they saw exfoliation take place, they would not permit such a wound to heal. Thus, they would not

lay down the skin in a wound over the shin-bone ; and if there was a lacerated scalp, they cut the torn piece off. And so too in operations and their after-treatment. If they extirpated a tumour, they cut away also all the surrounding skin. If they trephined the skull, they always scalped the patient ; and in amputating a limb, they cut by one stroke down to the bone, or after the flap-operation, they dressed the stump and flap as distinct wounds. These references to the past will suffice to remind you of the great change which the Practice of Surgery has undergone by virtue of a distinct recognition of the Restorative power in even one of its almost innumerable modes of manifestation.

Subcutaneous Reparation is another law of Pathology, which, like that of primary adhesion, has altogether changed the character of modern Surgical Practice. The wide difference—both in point of time and safety, between the healing of an injury under the circumstances of exclusion from, or exposure to, the atmospheric influence, has led to the important practical distinction of wounds, as being open or subcutaneous ; and the same law lies at the bottom of our recognised distinction of simple and compound fractures and dislocations. Hence it has become the primary principle of treatment with regard to all these lesions and injuries generally, to convert them from the condition of open into that of subcutaneous lesions—whether in the form of wound, fracture, dislocation, or other injury. The further development of this principle from the subcutaneous reparation of tendons, is exemplified by the practice of tenotomy. Introduced by Stromeyer, in 1831, the subcutaneous division of tendons has become the established treatment of deformities depending on muscular contractions ; and in the hands of Scarpa, Dieffenbach, Lonsdale, Little, Tamplin, W. Adams, and other surgeons, tenotomy has created that department of practice known as Orthopædic Surgery.

Enlarging our view of the Restorative power, we observe in the treatment of Aneurism, as now understood, only so many imitations of the modes of natural cure, by the formation of clot and obliteration of the aneurism. As one such imitation, we have the Hunterian application of ligature, to a sound por-

tion of artery, at some distance on the cardiac side of the aneurism, just to take off the force of the arterial current, and thus induce coagulation in the sac ; a mode of cure which has since been fulfilled also by temporary compression, and for which Surgery is indebted principally to the Dublin school. Distal ligature, or compression, would obtain the same result in the sac, by imitating occlusion of the vessel as occurring from the impaction of a piece of clot, dislodged from the sac into the artery below ; and manipulation of the aneurism, as proposed by Sir W. Fergusson, would effect this dislodgment by a manual procedure, which is, however, attended with considerable peril. Then again, galvano-puncture, and injection, are procedures designed to induce coagulation, somewhat as in the event of inflammation affecting the sac—another rare mode of spontaneous cure.

Not to amplify these illustrations of modern surgical treatment as responsive to the resources of Nature, *medical* treatment also has undergone a similar advancement, at least to the acknowledgment of their curative efficacy. Few there are who will not, each from his own practical experience, concur in the convictions expressed by an eminent American writer, Dr. Bigelow, in his treatise on "Nature in Disease."—"It is difficult to view the operations of Nature divested of the interferences of Art, so much do our habits and partialities incline us to neglect the former, and to exaggerate the importance of the latter. The mass of medical testimony is always on the side of Art. Medical books are prompt to point out the cure of disease. Medical journals are filled with the crude productions of aspirants to the cure of disease. Medical schools find it incumbent on them to teach the cure of disease. The young student goes forth into the world believing that if he does not cure disease, it is his own fault. Yet, when a score or two of years have passed over his head, he will come at length to the conviction that some diseases are controlled by Nature alone. He will often pause at the end of a long and anxious attendance, and ask himself how far the result of the case is different from what it would have been under less officious treatment than that which he has pursued ; how many, in the accumulated array of remedies which have supplanted each other in a



patient's chamber, have actually been instrumental in doing him any real good? He will also ask himself whether, in the course of his life, he has not had occasion to change his opinion, perhaps more than once, in regard to the management of the disease in question, and whether he does not even now feel the want of additional light?"

Among the aspects of modern surgery as an Art, *preventive* treatment has acquired a position beyond what might at first sight appear. The human body is encompassed by many external causes of disease, not only of a palpable character, but as subtle influences, wafted about in the air or impregnating the water, by either of which media they may find an entrance through any breach of the cutaneous surface, and must gain admission in the act of breathing or the reception of food. Other such agents there are, in the recognised form of virus, ever ready to be communicated from one affected human being to another, or from the bodies of animals through poisoned wounds. Here, then, are so many sources of contagion or infection. Antisepticism may be regarded as disinfection in the treatment of wounds, the object being to prevent the putrefaction of any animal fluid, as blood, liquor sanguinis, or pus, in contact with an open wound; and thence also to prevent the systemic infection known as pyæmia. The possibility of accomplishing this object is a demonstrated fact; whatever theory we admit as to its interpretation; whether we accept the germ-theory of Pasteur, or incline to the chemical theory of decomposition. Exclusion of atmospheric air from any wound or breach of surface, is imperative; with the interposition of some positively disinfecting or antiseptic agent, which shall prevent germination, if germs there are, that would be introduced. Hence the so-called antiseptic-dressings, in all their variety, and for the experimental investigation of which, with regard to carbolic acid, Surgery is so much indebted to Professor Lister. I scarcely need remind you of what preventive measures have done, both by means of cleanliness in dressings and clean air, to arrest the spread of pyæmia, erysipelas, and Hospital gangrene. In the Civil Hospitals of this country, Hospital gangrene has not, I believe, appeared for many years, excepting on two occasions;—in the Westminster

Hospital, 1835, and in University College Hospital, 1841. In most Continental Hospitals, also, the old reproach of Paré is no longer true; that in the Hôtel Dieu, for example, where this gangrene raged without intermission for 200 years,—“a young surgeon may learn the various forms of incisions, operations too, and the manner of dressing wounds, but the way of curing them he cannot learn,—every patient he takes in hand must die of gangrene.” From Military Hospitals, also,—those at least which I have seen, in the Crimea and at Scutari—this gangrene has been nearly banished by improved hygienic arrangements.

What shall we say as to the propagation of another contagious disease—Syphilis? No one will dispute its preventible nature, if only the primary inoculation be counteracted in time, before systemic infection has ensued; or that contamination can itself be prevented, by the suppression of sexual intercourse from persons affected with primary syphilis. Yet here we are engaged in the old contention, as to the *morality* of such intervention—so intimately and mysteriously are the moral feelings of our nature associated with the consideration of bodily disease. Yet surely, if by sin comes disease, it should be the highest function of morality to avert the evil consequence, as well as to overcome the evil cause. “The Contagious Diseases Acts” appear to be dictated by the highest moral enlightenment, no less than by the wisest physical policy. This opinion seems to have been endorsed by the Medical Society of London, in the recent discussion on Dr. Bell Taylor’s paper respecting these Acts.

There is another principle of prevention to which I would direct your attention—the principle of *substitute* diseases, whereby any human being having undergone a less destructive disease, a lesser evil, may be made exempt from one of a more dangerous character to himself and fellow beings. It was thus that Jenner, of immortal memory, substituted cow-pox, or vaccinia, for small-pox; and by preventing innumerable deaths has preserved the lives of communities. Let us hope that the bare possibility of vaccino-syphilitic inoculation will never be allowed, on the ground of morality, to rob mankind of the inestimable boon—vaccination. Is it not



probable that this principle of substitute-disease may yet be destined to further development, and to achieve yet greater triumphs in the history of Preventive Medicine? Or, again, if any given human being has already undergone a certain disease once, or must naturally pass through such ordeal once in the course of his life; may not that exaction be sufficient for at least that particular mode of bodily suffering? An approach to this subsequent exemption would seem to be vouchsafed by the non-recurrence, in general, of any eruptive fever in the same individual; and preventive Surgery has already made an attempt in the same direction. Thus, syphilisation, or repeated inoculation of the syphilitic virus to saturation of the system, was a process designed not only to cure constitutional syphilis, if possible, in a far shorter period than would otherwise be inevitable, but also for the purpose of preventing a recurrence of this disease. It is thus that Professor Böeck, of Christiania, has humanely advocated this principle of prevention, though apparently, at present, without much unequivocal success. Turning from external causes, to the origin and progress of disease in the body, we observe Modern Surgery assuming a preventive character by the arrest of diseased conditions, in various tissues, before spreading to parts continuous or adjoining. This was clearly the aim of Sir Benjamin Brodie's pathological observations respecting diseases of the joints, in relation to their treatment,—to discover “the morbid changes while still in an early stage,” and “the symptoms by which the incipient disease is indicated.”

While the prevention of disease has gradually become one of the leading aspects of Modern Surgery, a spirit of *Conservatism* has arisen to guide and regulate our surgical treatment. The surgical tendency of the age is to Conservative Operations. Given the necessity for some surgical operation for the removal of any part of the body, in consequence of otherwise incurable disease or injury, Conservatism inclines always towards the least act of sacrifice. Instead, therefore, of the sweeping operation of total separation or amputation, a compromise is sought, whereby the original constitution and frame, as from the Maker's hand, may be kept as nearly as possible in its normal condition of structural and functional integrity. This,

then, is Preservative Surgery. Surely, however, you will say, that is simply the object of all true surgery—the preservation of limb and life. Why, therefore, designate it by the superfluous prefix—conservative? “A rose by any other name would smell as sweet;” and Surgery will be equally saving, whether called conservative or not. Yet, on looking back to the gloomy records of the past, to the reckless amputations and mutilations which were then practised, it was not, perhaps, without a significant reason that the true character of Surgery should have been recalled, and a rallying standard erected, for a time at least,—the standard of Conservatism. It is thus, I think, that we may fairly appreciate and estimate the great impulse which Sir William Fergusson has given to Modern Surgery. In the year 1852,—a year pregnant with vast influence over the present and future generations of Surgery, Sir William Fergusson published his memorable cases of joint-excision, in the *Medical Times and Gazette*, as apt illustrations of what he designated “Conservative Surgery.” Eminent surgeons in this country had previously performed various such operations, Mr. Syme in 1830, having revived the operation of elbow-joint excision; and, I might carry you back to the originators of joint-excision—Park of Liverpool, and the Moreaus in France, and narrate to you all they did and suffered. Alas, they were permitted only to be pioneers in the cause of truth, for they attracted no followers, and no immediate successors. “Not a pen, not a voice, not a knife, stirred in England on the subject;” and he who eighty years afterwards uttered this reproach, in the Royal College of Surgeons of England, had been destined, principally among British surgeons, to revive the operations of joint-excision, and in the light of Conservatism. Not, however, without painful experience of opposition, and even ridicule, did Mr. Fergusson, and, I must add, two of the former Presidents of this Society—Mr. Hancock and Mr. Henry Smith—pursue their undaunted labours; so true is it, that the perversity of human nature exacts from every benefactor of his species that he shall undergo a certain amount of martyrdom.

More recently, another great change has begun to dawn upon the previously accepted estimate of excision in the treat-

ment of joint-disease. The comparison of excision with amputation must be abandoned in favour of an inquiry in the opposite direction—the advantages of the natural cure by ankylosis as compared with the same result from excision. Obviously this inquiry renders the term “conservative” altogether unnecessary and inappropriate, the question at issue no longer being that of the greater or less ablation of a part by one of two such modes of operative interference. No one has more conspicuously demonstrated the possibility of obtaining the best results by natural ankylosis than our present distinguished President, Mr. Thomas Bryant; and the reference of Excision to *this* standard of comparison, is one of the positions I advanced in my lectures on “Excisional Surgery,” which lately I had the honour of delivering before this Society. I thus designated this department of Modern Surgery, as simply and clearly expressing its operative character, apart from the misleading relationship to amputation, which the term conservative would suggest; and already the new title has found its way into the schools of Germany and France. In a far different sense I would still speak of conservatism in Surgery as representing that kind and least amount of treatment, on our part, which shall be responsive and supplemental to the preservative or curative processes of Nature.

Allied to the conservative or preservative character of Modern Surgery, as displayed in all operations where the removal of some portion of the body becomes imperative; another aspect of Surgery has assumed almost equal prominence—its reparative character, as manifested in the design of all the various operations contrived for the restoration of parts lost, whether as the result of injury or disease, or for the construction of parts wanting by congenital malformation. Thence the origin of *Plastic* Surgery. Enlightened by physiology in the fact, that each individual part of the body has its own separate vitality, and by pathology in the fact, that the whole organism is ever ready to re-acknowledge any outlying, or even detached portion—by processes of reparative union; Plastic Surgery has responded to these overtures of science by the contrivance of some operation of repair, in almost every region, nay in nearly every hole and corner of the body. Rhino-plastic operations,

originated by Gasparo Tagliacozzi, were introduced into this country by Carpue (1814); followed by Gräfe and Dieffenbach in Germany; and since almost perfected by Liston, Fergusson, and Skey. Plastic Surgery has visited the lip and palate for the reparation of their congenital defects—hare-lip and cleft-palate,—the myotomic modification of staphyloraphy having been devised by Sir William Fergusson; the eyelids have been submitted to various plastic procedures for loss of substance; and cheilo-plasty has restored portions of the lips destroyed by injury or disease. Then again, the genito-urinary organs have become the scene of busy reparative operations for the cure of rectal, urinary, and uterine fistulæ, by closing up these communications between adjoining passages and regaining their continuity—restitutions for which surgery is chiefly indebted to Dieffenbach, Bozeman, Baker Brown, Marion Sims, Simpson, Bryant, and Spencer Wells; while extroversion of the bladder has been met by constructive procedures in the hands of Richard, Nélaton, Pancoast, Ayres, and Holmes; consummated, however, by Wood's operation.

In the whole of this large class of operations, Plastic Surgery has availed itself of portions of integument borrowed, but not detached, from adjoining parts. But the physiological fact, known to Hunter, that detached portions of the body may be re-united or even transplanted,—thus declaring their independent vitality, had been witnessed in many curious instances, where portions of the nose, chin, or a finger-end, severed, have been restored; and even the additional facts of subsequent *growth* was not unknown; yet, the principle involved in these phenomena remained without much suggestiveness in the practice of Surgery. This double law of independent vitality and growth has recently received a most remarkable illustration in the practice of skin transplantation or engrafting; as originated by M. Riverdin, and introduced into this country by Mr. Pollock. By this principle of treatment, each engrafted particle of skin reproduces integument from itself as a centre; and thus large and otherwise irreparable ulcers may be healed, or contractile cicatrization prevented, which would inevitably have resulted in incurable deformity and functional inutility of the part.

What has Pathology done to guide the hand in the *perfor-*

*mance* of Surgical Operations? The question takes this executive form, because the design, or plan and purpose, of Surgical Operations, as indicated by Pathology, is exhibited in all those operations wherein the procedure is regulated by the character and amount of the diseased or injured condition. Now, the Operations of Surgery were formerly regarded as purely Anatomical performances. The "System of Operative Surgery, founded on the Basis of Anatomy," by Sir Charles Bell, was a type of that period. Yet the Surgeon is never called upon to touch the body in its healthy anatomical conditions. It is only under the circumstances of disease or injury, and as seen during life,—in other words when there are pathological conditions superadded to Anatomy, that the operating surgeon interferes. Certain operations are only apparent exceptions to this unexceptional law. It may be that the seats of operation and of disease or injury are not identical, that the operation is somewhat removed from that locality; as in amputations, and the ligature of arteries for aneurism. But even then, Pathology can alone determine whether we operate free of the diseased or injured part, and amid healthy tissues; that the bone and soft parts left by amputation are sound, and that the ligatured portion of artery is healthy. This negative application of Pathology, therefore, confirms its positive guidance in the performance of Surgical operations generally. The association of Pathology with healthy and dead Anatomy constitutes Surgical Anatomy properly so called; which is thus modified throughout by constant combination with morbid, and living conditions, in the performance of any operation. It is this knowledge which can alone correct the purely Anatomical impression of the Student, and safely guide the operating Surgeon. Thus, the various parts of the body, as seen in the dissecting-room, have undergone alterations of colour, consistence, elasticity, size, shape, situation, position, and relation, as presented to the Surgeon, when modified by the conditions of Disease and Life combined.

The introduction of this twofold principle into modern operative Surgery has been of slow development. Like everything great in nature or in the progress of truth, it



seems to have come only in the fulness of time. Pathological Anatomy was first recognised. Advocated by Searpa, in Italy, 1809, with regard to the performance of hernial operations in particular; the guidance of diseased conditions in surgical operations, was afterwards urged in France, by Sabatier 1832, Lisfranc 1845, Vidal (de Cassis) 1846, Sédillot 1853, Malgaigne 1861, Chassaignae in the same year, and more recently by Velpeau, and Nélaton. In Germany, the same truth was enforced by Chelius, Dieffenbach, and Langenbeck. So also in America, it was inculcated by Mott, Physick, and Gross. But, in this country, it has received a more tardy, and partial acknowledgment. John Bell, with his rare sagacity, and in his own graphic language, as if inspired by a new faith, overthrew the Anatomy of Surgery, as then taught in the schools;—affirming that “it were better the young surgeon had no conception of the forms of parts, than such as must be corrected by sad experience; for the parts of the human body are presented on the table of the Anatomist, not only in circumstances, but in forms, in which they can never at any after-period appear to the Surgeon.” Yet, nearly fifty years elapsed ere the guidance of Pathology in Operative Surgery acquired any recognised position, as in the works of Liston, Fergusson, and Skey; subsequently being enlarged by myself as a general Principle,—positively true in the great majority of operations, negatively true in all others—for the avoidance of unsound parts, and in both ways being most conducive to successful results.

There was yet a consummation to be reached in the modern Practice of Surgery, which should confer on it the title of the most beneficent, as well as having the rank of a scientific, Art. To abolish the pain we should otherwise be compelled to inflict; to lay our patient, for a time, as if in death, while the bodily organism, under surgical operation, is being repaired from the ravages of disease or the mutilations of injury, and thus refitted for the enjoyment of life; is not this to have a privilege entrusted to us unknown in the exercise of any other art, for do we not then become the ministers of an immeasurable exemption from human suffering? *Anæsthesia*, or the state of insensibility induced by the administration of various

agents, has completed the change of scene which Surgical operations formerly presented. The old operators—ignorant often of Anatomy, and always of Pathology—are described as “agitated, trembling, miserable;—hesitating in the midst of difficulties, turning round to their friends for that support which should come from within, feeling in the wound for things which they did not understand, holding consultations amid the cries of the patient, or even retiring to consult about his case—while he lay bleeding, in great pain, and awful expectation!” Now-a-days, this picture is commonly reversed,—see the calm composure of the surgeon, and the placid sleep of the patient. As usual in the history of great discoveries, glimpses of the truth had appeared long before its realization. The anæsthetic influence of nitrous oxide gas was known to Sir Humphry Davy, from personal experience, in the year 1800; nearly half a century before the American dentist, Dr. Horace Wells, conceived the idea of thus inducing anæsthesia in the practice of dental surgery—he having himself undergone tooth-extraction, without pain, after inhaling the gas, and having experimentally administered it to several patients with some success. The same idea seems to have occurred, about the same time, to Dr. Morton of Boston, who although a previous partner of Wells, sought, independently of him, to discover an efficient anæsthetic; and his experiments resulted in the introduction of sulphuric ether, 1846, and also of chloric ether. While the former agent is still extensively used, as an anæsthetic, in America, chloroform was submitted to experimental investigation in this country, by Sir James Simpson, during the ever memorable autumn of 1847; yet even here, the honour is so far shared, that it was Mr. Waldie, of the Apothecaries’ Hall, Liverpool, who first suggested to Simpson the employment of chloroform,—as the active principle of chloric ether; then Simpson first used this agent as an anæsthetic, and introduced it into the practice of Surgery. Subsequently, bichloride of Methylene and Chloral have been added to our anæsthetic resources, by the original researches of Dr. Richardson, who, with Dr. Anstie—both honoured members of this Society, have greatly enlarged our knowledge of anæsthesia. Nor is



this all. Local anæsthesia by the freezing of a part, has afforded a most efficient substitute for general anæsthesia, in all superficial and limited operations; thus also avoiding a certain degree of peril which is ever liable to occur from the systemic influence of inhalation. Dr. James Arnott, who originated this boon, proposed the application of a frigorific mixture—pounded ice and salt, and this method of inducing local anæsthesia had been in general use; but here again, Surgery is indebted to Dr. Richardson for the convenience of his more ready method,—the “ether-spray.” Both, then, by means of general, and local, anæsthetics, Modern Surgery has been raised to the highest ideal of perfection; in that, as Practitioners of the Art, we are enabled to bestow its remedial blessings, without the alloy of pain.

Lastly, however, to know our gains from observation, whether in the Science or Art of Surgery, we must count them. The impressions of experience, respecting pathology and treatment, are too vague and indistinct for any trustworthy conclusions. Accuracy of observation is essential to reliable results, and the number of observations taken, is also a very important consideration. Hence, the value of the *Numerical* method of inquiry or *Statistics*; which, by the process of counting, imposes a rigid check upon dissimilarity of the facts thus enumerated by units, and estimates their evidential significance by their number—absolute, or relative to other series of facts with which they may be compared and weighed. It is sometimes said of statistics, that anything can be proved by figures, for or against a given question at issue. The fallacy of this assertion is demonstrated by the very process of counting,—as the corrective of erroneous data; and let it be noticed, that the numerical method is used in even ordinary conversational discussion. What do you think, says A, about the new treatment of cholera? Well, says B, I have tried it in six cases without success. Ah! is the rejoinder, I have had twelve cases, with success in every instance. But, comes the question, were all, or how many of those cases true cholera, or only intestinal diarrhœa? Here, on a small scale, is a familiar illustration of Statistics; accuracy of observation, and of comparison, being insured

by counting our supposed facts. Why, then, object to the same method of inquiry in its extension to figures, numbering hundreds or thousands? The numerical method may seem dry and unattractive to persons of an imaginative disposition, for its inherent exactitude imposes on such persons a disagreeable restraint. But, as men of Science, and Practitioners of an Art involving the issues of life and death, truth should ever be our first consideration. And, for the fruits accruing from well-assorted collections of facts, and their comparison, we might point to the very important results—in the way of discovery, correction, or confirmation, which have thus been achieved in many departments of Medicine and Surgery. Perhaps no more important contributions have been made in the latter direction, than those by our President,—respecting the causes of death after Amputation; Compound Fracture, with Analysis of 300 cases; and Hernia, with Analysis of 126 fatal cases.

A few words further, allow me, as to the functions of the Medical Society of London. When we contemplate the wide range of knowledge which is included in the science of Surgery,—as comprising not only Pathology, with Anatomy and Physiology, but stretching back into the whole of Biology, and embracing also Chemistry and Physics; it will scarcely be expected that all these sections of Natural Science are equally represented in this Society. Men, who for the most part are actively engaged in the practice of Medicine and Surgery, have hardly the remaining energy and time requisite for the service of Science, in any form that is removed from their daily pursuits; however much their own sympathies and tastes may lead them to court the indulgence of her smile. Passing by the way-side, we are only just permitted to glance at her graceful figure, and, perhaps, to sip from the hollow of her hand, a mouthful or two of the limpid stream which flows from her crystal fountain. Yet, in our ranks, there have not been wanting those who have strayed out of the beaten track to explore the riches of the Temple, where this presiding goddess dwells. Look back, for a moment, and you there see some at least of our associates, past and present—Edward Jenner,

Marshall Hall, John Bishop, John Hilton, Golding Bird, Owen Rees, Garrod, Glover, Sibson, Guy, Lankester, Richardson, Crisp, Pavy, Thudichum—men who have won for themselves imperishable names in the deathless cause of Science. And, as Practitioners, Pathology is so inseparably connected with our avocations, that many more, too numerous to mention, have thence contributed to the Science of Surgery. The special function, however, of this Society is its practical work—in the clinical study of disease and its treatment. Here, the names of our workers bristle up so thick, that to attempt to enumerate them more particularly, than I have already done, incidentally, would be to write a full history of the Medical Society of London.

There is yet another feature which is almost peculiar to our Society,—I mean its *social* character. In other Societies, I think it may be said that the members remain more as individual units, rather than become incorporated into that intimate personal association, which makes us feel that we are “members one of another.” Perhaps this unification results, partly, from the freedom of intercourse we enjoy, in our large social gatherings during the year,—as we are about to experience on the present occasion.

The law of leasehold possession makes ninety-nine years equivalent to a century, and as in that sense, we now turn our centenary, I shall ask you all to join with me in heartily wishing this Society an increasing prosperity during the next hundred years, flourishing yet more and more for the cultivation of Medicine and Surgery, and for the promotion of Professional Brotherhood.

THE END.